UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,523	09/23/2003	Christoph Brabec	32860-000625/US	2570

30596 7590 12/01/2005

HARNESS, DICKEY & PIERCE, P.L.C.
P.O.BOX 8910
RESTON, VA 20195

EXAMINER	
WEBB, CHRISTOPHER G	

ART UNIT	PAPER NUMBER
2884	

DATE MAILED: 12/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,523	BRABEC ET AL.	
	Examiner	Art Unit	
	Christopher G. Webb	2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4-5, 7-9, 12-13, 15, 17, 20, 26, 28-29, 31-32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci et al. (US 5,454,880, hereafter Sariciftci).

With respect to claim 1, Yoshida discloses an X-ray detector comprising: a phosphor layer (fig. 2, element 1), adapted to generate electromagnetic radiation as a function of the occurrence of X-radiation; and a photodetector layer (fig. 2, element 10), adapted to detect electromagnetic radiation generated by the phosphor layer, wherein the phosphor layer includes ceramic material (col. 3, line 8) and the photodetector layer is joined to the phosphor layer (fig. 2). Yoshida does not disclose that the photodetector layer includes organic material. Sariciftci teaches the use of organic materials to make a photodiode. It would have been obvious at the time of invention to one of ordinary skill in the art to use the photodiode taught by Sariciftci as the photodetector layer of Yoshida. The use of organic materials provides "significant cost advantages" as well as "excellent mechanical properties" (col. 2, lines 6-19).

As to claims 2 and 29, Yoshida discloses that the ceramic material can be Gd_2O_2S (col. 3, line 8).

As to claims 4 and 31, Yoshida discloses that the device further comprises an intermediate layer (fig. 2, element 9) between and joined to the phosphor layer and the photodetector layer.

As to claims 5 and 32, Yoshida discloses that the intermediate layer includes a polymer (col. 3, lines 54-60).

As to claim 7, Yoshida discloses that a bottom electrode is provided (fig. 2, element 6). Yoshida does not disclose that the electrode includes an oxide. Sariciftci teaches the use of an electrode that includes an oxide (col. 8, lines 30-31). It would have been obvious at the time of invention to one of ordinary skill in the art to use the oxide as taught by Sariciftci as the bottom electrode disclosed by Yoshida. Using an oxide allows for a choice of electrode material that is transparent to the wavelengths of interest.

As to claim 8, Yoshida does not disclose an oxide that is ITO. Sariciftci teaches that the oxide is ITO. It would have been obvious at the time of invention to one of ordinary skill in the art to choose ITO as the specific oxide as noted above with respect to claim 7.

As to claims 9 and 26, Yoshida discloses a top electrode (fig. 2, element 15) joined to the photodetector layer.

As to claims 12 and 34, Yoshida discloses a CT device comprising the X-ray detector of claim 1 (col. 1, lines 8-9).

As to claim 13, Yoshida discloses an X-ray detector comprising: producing the phosphor layer from ceramic material (col. 3, lines 7-9) and applying the photodetector

layer via phosphor layer via at least one of spinning processing, printing processing, beam/jet processing and sticking the photodetector layer on the phosphor layer as a film (col. 4, lines 57-60). Yoshida does not disclose that the photodetector layer includes organic material. Sariciftci teaches the use of organic materials to make a photodiode. It would have been obvious at the time of invention to one of ordinary skill in the art to use the photodiode taught by Sariciftci as the photodetector layer of Yoshida as noted above with respect to claim 1.

As to claim 15, Yoshida discloses the step of applying an intermediate layer to the phosphor layer via at least one of spinning processing, printing processing, beam/jet processing and sticking the photodetector layer on the phosphor layer as a film (col. 4, lines 24-28), before applying the photodetector layer (col. 4, lines 57-60).

As to claims 17 and 20, Yoshida discloses that the device further comprises an intermediate layer (fig. 2, element 9) between and joined to the phosphor layer and the photodetector layer.

As to claim 28, Yoshida discloses an X-ray detector comprising: means for generating electromagnetic radiation as a function of the occurrence of X-radiation (col. 1, lines12-14), including a phosphor layer (fig. 2, element 1) and means for detecting electromagnetic radiation generated by the phosphor layer (col. 1, lines 14-16), including a photodetector layer (fig. 2, element 10), wherein the phosphor layer includes ceramic material (col. 3, line 8) and the photodetector layer is joined to the phosphor layer (fig. 2). Yoshida does not disclose that the photodetector layer includes organic material. Sariciftci teaches the use of organic materials to make a photodiode. It would

have been obvious at the time of invention to one of ordinary skill in the art to use the photodiode taught by Sariciftci as the photodetector layer of Yoshida as noted above with respect to claim 1.

Claims 3, 16, 18-19, 22, 24, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claims 1, 2, 28 above, and further in view of Feygin (US 2002/0182111 A1, hereafter Feygin).

With respect to claims 3, 16, and 30, Yoshida does not disclose specific organic materials. Sariciftci teaches the use of p-type (col. 4, line 60) PPV (fig. 1F) and n-type fullerenes (col. 5, lines 3-4). Sariciftci also notes that "only the fullerene moiety is required" for its use as an acceptor. Yoshida in view of Sariciftci does not teach the use of fullerene-PCBM as the specific fullerene. Feygin teaches the use of fullerene-PCBM with P3AT (paragraph [0059], lines 3-5). It should also be noted that Sariciftci also teaches the use of P3AT (fig. 1K) with a fullerene. It would have been obvious at the time of invention to one of ordinary skill in the art to use fullerene-PCBM as the n-type fullerene taught by Sariciftci with the p-type PPV. As noted by Feygin, fullerene-PCBM is useful for imaging applications in the visible spectrum.

As to claims 18 and 19, Yoshida discloses that the device further comprises an intermediate layer (fig. 2, element 9) between and joined to the phosphor layer and the photodetector layer.

As to claims 22 and 24, Yoshida discloses that the intermediate layer includes a polymer (col. 3, lines 54-60).

Claims 6, 21, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claim 5, 20, and 32 above, and further in view of Tyan (US 6,693,296 B1, hereafter, Tyan).

With respect to claims 6, 21, and 33, Yoshida in view of Sariciftci does not disclose that the polymer is PEDOT-PSS. Tyan teaches an organic diode that uses PEDOT-PSS with PPV. It would have been obvious at the time of invention to one of ordinary skill in the art to use PPV as the intermediate layer polymer taught by Yoshida in view of Sariciftci. PEDOT-PSS is known to be conductive, transparent to visible light, and stable under normal conditions, and it would therefore be a desirable compound for use with an organic photodetector.

Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claim 9 above, and further in view of Parthasarathy et al. (US 5,506,409, hereafter Parthasarathy).

With respect to claim 10, Yoshida in view of Sariciftci does not disclose that the top electrode includes a metal or a metal alloy. Parthasarathy teaches an electrode comprised of a metal (col. 2, lines 62-64). It would have been obvious at the time of invention to one of ordinary skill in the art to use the electrode taught by Parthasarathy in the apparatus taught by Yoshida in view of Sariciftci. The electrode is desirable because of its low work function.

As to claim 11, Yoshida in view of Sariciftci does not disclose that the top electrode includes a conductive polymer. Parthasarathy teaches an electrode comprised of a conductive polymer (col. 7, lines 23-25). It would have been obvious at the time of invention to one of ordinary skill in the art to use the electrode taught by Parthasarathy in the apparatus taught by Yoshida in view of Sariciftci. The electrode is desirable because it is transparent in the region of interest and also conductive.

Claims 14 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci as applied to claim 13 above, and further in view of Possin et al. (US 2003/0122083 A1, hereafter Possin).

With respect to claim 14, Yoshida does not disclose the step of polishing the phosphor layer before applying the photodetector layer. Possin teaches the step of polishing the phosphor layer (claim 21, lines 10-11) before applying the photodetector layer (claim 21, lines 16-30).

As to claim 27, Yoshida discloses the step of applying an intermediate layer to the phosphor layer via at least one of spinning processing, printing processing, beam/jet processing and sticking the photodetector layer on the phosphor layer as a film (col. 4, lines 24-28), before applying the photodetector layer (col. 4, lines 57-60).

Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida in view of Sariciftci and Feygin as applied to claims 22 and 24 above, and further in view of Tyan.

With respect to claims 23 and 25, Yoshida in view of Sariciftci and Feygin does not disclose that the polymer is PEDOT-PSS. Tyan teaches an organic diode that uses PEDOT-PSS with PPV. It would have been obvious at the time of invention to one of ordinary skill in the art to use PPV as the intermediate layer polymer taught by Yoshida in view of Sariciftci. PEDOT-PSS is known to be conductive, transparent to visible light, and stable under normal conditions, and it would therefore be a desirable compound for use with an organic photodetector.

Response to Arguments

Applicant's arguments filed 30 Sept. 2005 have been fully considered but they are not persuasive. In the applicant's remarks, pages 9-12, the applicant asserts that the examiner's combination of the Yoshida and Saricifti references relies on hindsight reasoning. On page 122, the applicant states "Yoshida and Saricifti are directed to two completely different technologies (i.e., X-ray detectors and photovoltaic cells)." Note that the element referred to in the office action (Yoshida, Fig. 2, element 10) is a "photoelectric converter" (Yoshida, col. 2, line 59). A "photoelectric converter" is a "photovoltaic cell," and therefore the references do not disclose different technologies. Furthermore, the element lacking in Yoshida was the presence of organic materials in the detector. It would have been obvious at the time of invention to one of ordinary skill in the art to consider using organic materials, as the use of organic materials has become widespread in modern technology. This would direct the skilled artisan to Saricifti or similar prior art. This same reasoning applies to the arguments made on

pages 13 and 14 of the applicant's remarks. The remainder of the applicant's arguments rely on those treated above, and are therefore also rendered moot.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher G. Webb whose telephone number is (571) 272-8449. The examiner can normally be reached on 9AM - 5:30PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CGW

DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800